درسا هادی زاده - یازدهم تجربی A

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$$\lim_{x\to 1}\frac{4x^2-7x+3}{5x^2-8x+3}=\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{\cancel{(x-1)}(4x-3)}{\cancel{(x-1)}(5x-3)}=\frac{1}{2}$$

$$\begin{array}{l|l} 4x^2-7x+3 & x-1 \\ -4x^2+4x & 4x-3 \\ \hline -3x+3 & \\ +3x-3 & \\ \hline 0\quad 0 & \end{array}
\qquad
\begin{array}{l|l} 5x^2-8x+3 & x-1 \\ -5x^2+5x & 5x-3 \\ \hline -3x+3 & \\ \hline - & \end{array}$$

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$$\lim_{x\to 0}\frac{|3x-1|-|3x+1|}{x}=\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{-3x+\cancel{1}-3x-\cancel{1}}{x}=-6$$

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$$\lim_{x\to 4}\frac{x-4}{\sqrt{x}-2}=\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{(\sqrt{x}+2)\cancel{(\sqrt{x}-2)}}{\cancel{\sqrt{x}-2}}=4$$

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$$\lim_{x\to 2}\frac{x-\sqrt{2x}}{2x^2-x-6}=\frac{0}{0}\xrightarrow{\text{رفع ابهام}}\frac{\sqrt{x}(\sqrt{x}-\sqrt{2})}{(x-2)(2x+3)}=\frac{\sqrt{x}\,\cancel{(\sqrt{x}-\sqrt{2})}}{\cancel{(\sqrt{x}-\sqrt{2})}(\sqrt{x}+\sqrt{2})(2x+3)}$$

$$\begin{array}{l|l} 2x^2-x-6 & x-2 \\ -2x^2+4x & 2x+3 \\ \hline 3x-6 & \end{array}
\qquad =\frac{\sqrt{2}}{7(2\sqrt{2})}=\frac{\cancel{\sqrt{2}}}{14\cancel{\sqrt{2}}}=\frac{1}{14}$$

$$\lim_{x\to 1}\frac{1-\sqrt{x}}{2-\sqrt{5-x}}\times\frac{1+\sqrt{x}}{1+\sqrt{x}}\times\frac{2+\sqrt{5-x}}{2+\sqrt{5-x}}=\frac{\overset{-1}{\cancel{1-x}}}{\cancel{4-5+x}}\times\frac{4}{2}=-2$$

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$$\lim_{x\to 4}\frac{\sqrt{3x+4}-4}{\sqrt[3]{5x+7}-3}\times\frac{\sqrt{3x+4}+4}{\sqrt{3x+4}+4}\times\frac{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}}{\sqrt[3]{(5x+7)^2}+9+3\sqrt[3]{5x+7}}$$

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$$=\frac{3x+4-16}{5x+7-27}\times\frac{27}{8}=\frac{3x-12}{5x-20}\times\frac{27}{8}=\frac{3\cancel{(x-4)}}{5\cancel{(x-4)}}\times\frac{27}{8}=\frac{81}{40}$$

$$\lim_{x\to 1}\frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1}\times\frac{\sqrt{3x+\sqrt{x}}+2}{\sqrt{3x+\sqrt{x}}+2}\times\frac{\sqrt[3]{(x)^2}+1+\sqrt[3]{x}}{\sqrt[3]{(x)^2}+1+\sqrt[3]{x}}$$

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$$=\frac{3x+\sqrt{x}-4}{x-1}\times\frac{3}{4}=\frac{\cancel{(\sqrt{x}-1)}(\sqrt{x}+\frac{4}{3})}{\cancel{(\sqrt{x}-1)}(\sqrt{x}+1)}=\frac{7}{8}$$

$$\lim_{x\to\pi} \frac{1+\cos^3 x}{\sin^2 x} = \frac{0}{0} \xrightarrow{\text{(با اتحاد)}} \frac{\cancel{(1+\cos x)}(1+\cos^2 x-\cos x)}{\cancel{(1+\cos x)}(1-\cos x)} = \frac{3}{2}$$

$\sin^2 x = 1-\cos^2 x$

$$\lim_{x\to\frac{\pi}{4}} \frac{1-\tan x}{\sin x-\cos x} = \frac{\frac{\cos x-\sin x}{\cos x}}{\sin x-\cos x} = \frac{-\cancel{(\sin x-\cos x)}}{\cos x} \times \frac{1}{\cancel{\sin x-\cos x}}$$

$$= -\sqrt{2}$$

$$\lim_{x\to\frac{3\pi}{4}} \frac{\tan^2 x-1}{\cos 2x} = \frac{\frac{\sin^2 x}{\cos^2 x}-1}{\cos^2 x-\sin^2 x} = \frac{\frac{\sin^2 x-\cos^2 x}{\cos^2 x}}{\cos^2 x-\sin^2 x}$$

با $\cos 2\alpha = \cos^2\alpha-\sin^2\alpha$

$$-\frac{\cancel{(\cos^2 x-\sin^2 x)}}{\cos^2 x} \times \frac{1}{\cancel{(\cos^2 x-\sin^2 x)}} = -2$$

۷) نوع ابهام $\rightarrow$

$$\lim_{x\to1} \frac{\sqrt{3x+\sqrt{x}}-2}{\sqrt[3]{x}-1} \times \frac{\sqrt{3x+\sqrt{x}}+2}{\sqrt[3]{x^2}+1+\sqrt[3]{x}} \times \frac{3}{4}$$

$$\xrightarrow{\text{HOP}} \frac{3}{4} \times \frac{3+\frac{1}{2\sqrt{x}}}{1} = \frac{3}{4} \times \frac{7}{2} = \frac{21}{8}$$